

Abstract

The Stent and the method of Manufacturing Same (Variants)

The inventions relate to the field of medicine and can be used in endoprosthetics for restoring a lumen in narrowed sections of vessels and other hollow organs.

The stent is made as a netted hollow volumetric body, formed by interweaving of several groups of windings from a single length of a thread, placed along helical spirals with opposite entry directions. A material of the thread possesses elasticity and shape memory effect. Cells which are opposite with respect to the axis of the stent, are displaced with respect to each other, and the stent thread has different elasticity in its separate sections, preserving the same thickness of the thread along the whole length of the stent. In the second variant of the stent its geometry is changed by way of making the stent with separate areas having a different axial curvature. The third variant of the stent unites the first and the second variants of the stent. In addition to that in all three variants the stent is manufactured from a medical nitinol Ti Ni.

The method of stent manufacturing includes the formation of a netted hollow metallic body from a metallic thread by interweaving its windings, wound on a mandrel made as a body of revolution with a rectilinear longitudinal axis, and a pre-deformation of the stent on the mandrel by way of its quenching from the temperature $630 - 660^{\circ}\text{C}$ into water, which attributes a maximum elasticity to this stent. After the mandrel is removed the elasticity of separate sections of the stent is reduced, subjecting them to a secondary heat treatment at the temperature of $330 - 550^{\circ}\text{C}$ during from 1 to 30 minutes. In the rest variants of the method, the pre-deformation of the stent is conducted twice, first by way of primary heat treatment of the stent on the mandrel with a rectilinear longitudinal axis at the temperature of $330 - 390^{\circ}\text{C}$ during 5-20 minutes, and then on the mandrel with a curvilinear longitudinal axis, the form of which corresponds to the form of a prostheticated vessel. By that, by changing the time and temperature of the secondary heat treatment, the elasticity of the thread in separate sections of the stent and/or axial curvature of the stent are changed.

7 independent claims, 2 dependent claims.